

AMENDMENTS TO THE CLAIMS

Kindly amend claims 65, 66, 94, and 96. This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

Claims 1-64 (canceled)

Claim 65 (currently amended): A multi-point probe for testing electric properties on a specific location of a test sample, comprising:

a supporting body defining a first surface;

a first multitude of conductive probe arms, each of said conductive probe arms defining a proximal end and a distal portion and distal end being positioned in co-planar relationship with said first surface of said supporting body along substantially the entire length of said conductive probe arms, and said conductive probe arms being movable in x, y, or z planes and being connected to said supporting body at said proximal ends thereof and having said distal ends freely extending and away from said supporting body, leaving said distal portions and ends free to contact a sample unsupported by said supporting body, giving individually flexible motion to said first multitude of conductive probe arms for allowing said distal end to contact said specific location of said test sample, said conductive probe arms freely extending from said supporting body in co-planar relationship with said first surface of said supporting body along substantially the entire length of said conductive probe arms; and

a second multitude of conductive guarding electrodes being positioned on second multitude of areas defined on said first surface between said first multitude of conductive probe arms, and comprising an insulating spacing between said electrodes and said conductive probe arms, said second multitude of conductive electrodes for active guarding and extending along side said first multitude of probe arms only up to their distal portions, so that said second electrodes are shorter than said first probe arms and said distal portions and ends of said first probe arms are free to contact the test sample.

Claim 66 (currently amended): A multi-point probe for testing electric properties on a specific location of a test sample, comprising:

a supporting body defining a first surface;

a first multitude of conductive probe arms, each of said conductive probe arms defining a proximal end and a distal portion and distal end being positioned in co-planar relationship with said first surface of said supporting body along substantially the entire length of said conductive probe arms, and being connected to said supporting body at said proximal ends thereof and having said distal ends freely extending and away from said supporting body, leaving said distal portions and ends free to contact a sample unsupported by said supporting body, giving individually flexible motion to said first multitude of conductive probe arms for allowing said distal end to contact said specific location of said test sample; and

a second multitude of conductive guarding electrodes being positioned on second multitude of areas defined on said first surface between said first multitude of conductive probe arms, and comprising an insulating spacing between said electrodes and said conductive probe arms, said second multitude of conductive electrodes for active guarding and extending along side said first multitude of probe arms only up to their distal portions, so that said second electrodes are shorter than said first electrodes and said distal portions and ends of said first probe arms are free to contact test surfaces and

~~The multi-point probe according to claim 65, wherein said second multitude of areas are undercut in relation to the plane of said first surface of said supporting body.~~

Claims 67-68 (cancelled)

Claim 69 (previously presented): The multi-point probe according to claim 65, wherein said second multitude of areas are combinations of undercut and co-planar in relation to the plane of said first surface of said supporting body.

Claim 70 (previously presented): The multi-point probe according to claim 66, wherein said second multitude of areas provide a supporting surface of said supporting body smaller than the surface of said conductive probe arms facing said supporting body.

Claim 71 (cancelled)

Claim 72 (previously presented): The multi-point probe according to claim 65, wherein said first multitude of conductive probe arms are unidirectional, constituting a first multitude of parallel free extensions of said supporting body.

Claim 73 (previously presented): The multi-point probe according to claim 65, wherein said supporting body further comprises a second surface parallel to said first surface, and

said multi-point probe further comprises an additional multitude of conductive probe arms defining a proximal end and a distal end being positioned in co-planar relationship with said second surface of said supporting body, and

said additional conductive probe arms being connected to said supporting body at said proximal ends thereof and having said distal ends freely extending from said supporting body, giving individually flexible motion to said additional multitude of conductive probe arms.

Claim 74 (previously presented): The multi-point probe according to claim 65, wherein said first multitude of conductive probe arms are in a multiple of 2, ranging from at least 2 said conductive probe arms to 64 said conductive probe arms.

Claim 75 (previously presented): The multi-point probe according to claim 74, wherein said first multitude of conductive probe arms have 4 said conductive probe arms.

Claim 76 (previously presented): The multi-point probe according to claim 65, wherein said first multitude of conductive probe arms have a substantially rectangular cross section defining:

the dimension of width as a distance between the lines of said rectangular cross section perpendicular to the plane of said first surface of said supporting body,

the dimension of depth as a distance between the lines of said rectangular cross section parallel to the plane of said first surface of said supporting body, and

the dimension of length as a distance from said proximal end of said conductive probe arms to said distal end of said conductive probe arm.

Claim 77 (previously presented): The multi-point probe according to claim 65, wherein said first multitude of conductive probe arms have a ratio of said length to said width within the range of 500:1 to 5:1.

Claim 78 (previously presented): The multi-point probe according to claim 77, wherein said first multitude of conductive probe arms have a ratio of said length to said width within the range of 50:1 to 10:1.

Claim 79 (previously presented): The multi-point probe according to claim 78, wherein said first multitude of conductive probe arms have a ratio of said length to said width of 10:1.

Claim 80 (previously presented): The multi-point probe according to claim 65, wherein said first multitude of conductive probe arms have a ratio of said width to said depth within the range of 20:1 to 2:1.

Claim 81 (previously presented): The multi-point probe according to claim 65, wherein said first multitude of conductive probe arms have a ratio of said width to said depth of 10:1.

Claim 82 (previously presented): The multi-point probe according to claim 65, wherein said first multitude of conductive probe arms have tapered elements extending from said distal end of said conductive probe arms.

Claim 83 (previously presented): The multi-point probe according to claim 65, wherein said first multitude of conductive probe arms have pointed shaped elements extending from said distal end of said conductive probe arms.

Claims 84-86 (cancelled):

Claim 87 (previously presented): The multi-point probe according to claim 65, wherein said first multitude of conductive probe arms have said lengths in the range of 20 μm to 2 mm.

Claim 88 (previously presented): The multi-point probe according to claim 87, wherein said first multitude of conductive probe arms have said lengths of 200 μm .

Claim 89 (previously presented): The multi-point probe according to claim 65, wherein said first multitude of conductive probe arms have a separation of distal ends of said conductive probe arms in the range of 1 μm to 1 mm.

Claim 90 (previously presented): The multi-point probe according to claim 89, wherein said first multitude of conductive probe arms have a separation of distal ends of said conductive probe arms in the range of 20 μm to 60 μm .

Claim 91 (previously presented): The multi-point probe according to claim 65, wherein said supporting body is of a ceramic material.

Claims 92-93 (cancelled)

Claim 94 (currently amended): A multi-point probe for testing electric properties on a specific location of a test sample, comprising:

- a supporting body defining a first surface;

- a first multitude of conductive probe arms, each of said conductive probe arms defining a proximal end and a distal end being positioned in co-planar relationship with said first surface of said supporting body along substantially the entire length of said conductive probe arms, and said conductive probe arms being connected to said supporting body at said proximal ends thereof and having said distal ends freely extending from said supporting body, giving individually flexible motion to said first multitude of conductive probe arms for allowing said distal end to contact said specific location of said test sample, said conductive probe arms freely extending from said supporting body in co-planar relationship with said first surface of said supporting body along substantially the entire length of said conductive probe arms; and

- a second multitude of conductive guarding electrodes being positioned on second multitude of areas defined on said first surface between said first multitude of conductive probe arms, and comprising an insulating spacing between said electrodes and said conductive probe arms, said second multitude of conductive electrodes for active guarding, ~~said supporting body being of a semiconducting material, said semiconducting material comprising at least one of Ge and Si~~ said first probe arms extending beyond said second guarding electrodes, so that said second guarding electrodes are shorter than said first probe arms and their distal ends are free to contact the test sample;

- a first conductive layer positioned on said multitude of conductive probe arms; and

- a second conductive layer acting as said electrodes on said supporting body between said first multitude of conductive probe arms.

Claim 95 (previously presented): The multi-point probe according to claim 94, wherein said conductive layer comprises at least one conductive material taken from the group of Au, Ag, Pt, Ni, Ta, Ti, Cr, Cu, Os, W, Mo, Ir, Pd, Cd, Re, conductive diamond and metal silicides.

Claim 96 (currently amended): A multi-point probe for testing electric properties on a specific location of a test sample, comprising:

a supporting body defining a first surface;

a first multitude of conductive probe arms, each of said conductive probe arms defining a proximal end and a distal end being positioned in co-planar relationship with said first surface of said supporting body along substantially the entire length of said conductive probe arms, and said conductive probe arms being connected to said supporting body at said proximal ends thereof and having said distal ends freely extending from said supporting body, giving individually flexible motion to said first multitude of conductive probe arms for allowing said distal end to contact said specific location of said test sample, said conductive probe arms freely extending from said supporting body with said distal ends freely extending and away from said supporting body, leaving said distal ends free to contact a sample unsupported by said supporting body and in co-planar relationship with said first surface of said supporting body along substantially the entire length of said conductive probe arms; and

a second multitude of conductive guarding electrodes being positioned on second multitude of areas defined on said first surface between said first multitude of conductive probe arms, and comprising an insulating spacing between said electrodes and said conductive probe arms, said second multitude of conductive electrodes for active guarding,

a third multitude of conductive tip elements extending from said distal end of said first multitude of conductive probe arms

said first probe arms extending beyond said second guarding electrodes, so that said second guarding electrodes are shorter than said first probe arms and their distal ends are free to contact the test sample.

Claim 97 (previously presented): The multi-point probe according to claim 96, wherein each of said third multitude of conductive tip elements comprises a primary section and a secondary section, said conductive tip elements being connected to said

conductive probe arms through respective primary sections thereof and said secondary sections defining free contacting ends.

Claim 98 (previously presented): The multi-point probe according to claim 97, wherein each of said primary sections defines a first axial direction, said first axial direction constituting an increase of separation between said supporting body and said free contacting ends.

Claim 99 (previously presented): The multi-point probe according to claim 98, wherein said first axial direction of said primary section constitutes a decrease of separation between said free contacting ends of said third multitude of conductive tip elements.

Claim 100 (previously presented): The multi-point probe according to claim 99, wherein said first axial direction of said primary section constitutes a decrease of separation between adjacent said free contacting ends of said third multitude of conductive tip elements.

Claim 101 (previously presented): The multi-point probe according to claim 100, wherein each of said secondary sections defines a second axial direction, said second axial direction constituting an increase of separation between said supporting body and said free contacting ends.

Claim 102 (previously presented): The multi-point probe according to claim 101, wherein said second axial direction of said secondary section constitutes a decrease of separation between said free contacting ends of said third multitude of conductive tip elements.

Claim 103 (previously presented): The multi-point probe according to claim 102, wherein said second axial direction of said secondary section constitutes a decrease of

separation between adjacent said free contacting ends of said third multitude of conductive tip elements.

Claim 104 (previously presented): The multi-point probe according to claim 103, wherein said first axial direction of said primary sections extends parallel to the plane defined by said first surface of said supporting body.

Claim 105 (previously presented): The multi-point probe according to claim 104, wherein said first axial direction of said primary sections extends in a direction converging towards the plane defined by said second surface of said supporting body.

Claim 106 (previously presented): The multi-point probe according to claim 105, wherein said second axial direction of said secondary sections extends parallel to the plane defined by said first surface of said supporting body.

Claim 107 (previously presented): The multi-point probe according to claim 105, wherein said second axial direction of said secondary sections extends in a direction converging towards the plane defined by said second surface of said supporting body.

Claim 108 (previously presented): The multi-point probe according to claim 107, wherein the number of conductive tip elements in said third multitude is equal to the number of conductive probe arms in said first multitude.

Claim 109 (previously presented): The multi-point probe according to claim 107, wherein the number of conductive tip elements in said third multitude is less than the number of conductive probe arms in said first multitude.

Claim 110 (previously presented): The multi-point probe according to claim 107, wherein the number of conductive tip elements in said third multitude is greater than the number of conductive probe arms in said first multitude.

Claim 111 (previously presented): The multi-point probe according to claim 107, wherein the number of conductive tip elements in said third multitude is divisible by 2.

Claim 112 (previously presented): The multi-point probe according to claim 107, wherein said third multitude of conductive tip elements have a separation of said free contacting ends of said conductive tip elements in the range of 1 nm to 100 nm.

Claim 113 (previously presented): The multi-point probe according to claim 107, wherein said third multitude of conductive tip elements have a separation of said free contacting ends of said conductive tip elements in the range of 2 nm to 50 nm.

Claim 114 (previously presented): The multi-point probe according to claim 107, wherein said third multitude of conductive tip elements have a separation of said free contacting ends of said conductive tip elements in the range of 5 nm to 20 nm.

Claim 115 (previously presented): The multi-point probe according to claim 107, wherein each of said conductive tip elements define an overall length as distance between said distal ends of conductive probe arms and said free contacting ends of said conductive tip elements, said overall length being in the range of 100 nm to 100 μm .

Claim 116 (previously presented): The multi-point probe according to claim 115, wherein said overall length is in the range of 500 nm to 50 μm

Claim 117 (previously presented): The multi-point probe according to claim 115, wherein said overall length is in the range 1 μm to 10 μm .

Claim 118 (previously presented): The multi-point probe according to claim 107, wherein each of said conductive tip elements defines a diameter, said diameter being in the range of 10 nm to 1 μm .

Claim 119 (previously presented): The multi-point probe according to claim 118, wherein said diameter is in the range of 50 nm to 500 nm.

Claim 120 (previously presented): The multi-point probe according to claim 107, wherein said third multitude of conductive tip elements consist primarily of carbon.

Claim 121 (previously presented): The multi-point probe according to claim 120, wherein said third multitude of conductive tip elements further include a concentration of contaminants.

Claim 122 (withdrawn): A multi-point testing apparatus for testing electric properties on a specific location of a test sample, comprising:

- (a) means for receiving and supporting said test sample;
- (b) electric properties testing means including electric generator means for generating a test signal and electric measuring means for detecting a measuring signal;
- (c) a multi-point probe, comprising:
 - (i) a supporting body;
 - (ii) a first multitude of conductive probe arms positioned in co-planar relationship with a surface of said supporting body, and freely extending from said supporting body, giving individually flexible motion of said first multitude of conductive probe arms; and
 - (iii) said conducting probe arms originating from a process of producing said multi-point probe including producing said conductive probe arms on supporting wafer body in facial contact with said supporting wafer body and removal of a part of said wafer body providing said supporting body and providing said conductive probe arms freely extending from said supporting body;
 - (iv) a second multitude of conductive electrodes being position on second multitude of areas defined on said first surface between said first multitude of conductive probe arms, and comprising an insulating spacing between said electrodes and said conductive probe arms, said second multitude of conductive electrodes especially being suitable for active guarding,

(v) said multi-point probe communicating with said electric properties testing means; and

(d) reciprocating means for moving said multi-point probe relative said test sample so as to cause said conductive probe arms to be contacted with said specific location of said test sample for performing said testing of electric properties thereof.

Claim 123 (withdrawn): The multi-point testing apparatus according to claim 122, wherein said electric properties testing means further comprises means for electric properties probing of said test sample.

Claim 124 (withdrawn): The multi-point testing apparatus according to claim 123, wherein said reciprocating means further comprises holding means for said means for said multi-point probe.

Claim 125 (withdrawn): The multi-point testing apparatus according to claim 124, further comprising means for positioning said holding means across said test sample and recording of a location of said holding means relative to said test sample.

Claim 126 (withdrawn): The multi-point testing apparatus according to claim 125, wherein said means for positioning comprises maneuverability in all spatial directions, being directions co-planar to said test sample and directions perpendicular to said test sample.

Claim 127 (withdrawn): The multi-point testing apparatus according to claim 126, wherein said means for positioning further comprises means for angular movement of said holding means, such as to provide angular positions for said means for said multi-point probe.

Claim 128 (withdrawn): The multi-point testing apparatus according to claim 127, wherein said means for positioning further comprises means for angular movement of

said holding means along an axis parallel to surface of said test sample, such as to provide angular positions for said means for said multi-point probe.

Claim 129 (withdrawn): The multi-point testing apparatus according to claim 128, wherein said means for positioning further comprises means for angular movement of said holding means along an axis perpendicular to surface of said test sample, such as to provide angular positions for said means for said multi-point probe.

Claim 130 (withdrawn): The multi-point testing apparatus according to claim 129, wherein said means for positioning further comprises means for sensing contact between said test sample and said means for said multi-point probe.

Claims 131-139 (cancelled)

Claim 140 (previously presented): The probe according to claim 65 wherein said probe arms are moveable in all spatial directions.